

### **ABSTRACT OF THE DISCLOSURE**

A portable automated biomonitoring system for monitoring water quality includes an exposure chamber for housing an aquatic organism and a water inlet for directing water to the exposure chamber. The aquatic organism has ventilatory behavior and body movement sensitive to water quality. Electrodes sense electrical signals produced by the organism during its ventilatory behavior and body movement, and a controller responsive to signals from the electrodes determines a plurality of ventilatory parameters based on the signals. The ventilatory parameters are compared with corresponding thresholds to determine when the water to which the organism is exposed has caused physiological stress to the organism. The water being evaluated may be recirculated through the system for further analysis.